

REPORT

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THIS IS UNEVALUATED INFORMATION FOR THE RESEARCH  
USE OF TRAINED INTELLIGENCE ANALYSTS

SUPERFICIALITY OF GUINEA FIGS

FOR IMMUNOLOGICAL EXPERIMENTS ON HYDROPHOBIA

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In recent years spotted guinea pigs have been used by many authors as laboratory animals for the propagation of a number of contagions (glanders, tetanus, diphtheria, hydrophobia, smallpox, exanthematic typhus, and others). By means of these works it has been established that guinea pigs were in certain instances valuable laboratory animals, capable of replacing the usual smaller test animals.

In our previous works (Palavandov, Serebriannaya, and Pugach; Palavandov, Pugach, and Divgun) we demonstrated that guinea pigs were very susceptible to hydrophobia, and were not inferior to other laboratory animals in this respect. Guinea pigs are especially valuable in the study of hydrophobia owing to their capacity of forming Negri corpuscles upon infection by a fixed virus.

Regarding the utilization of guinea pig for immunological investigations, a number of works are known to us (Vogelberg and Joller<sup>1</sup>; Vogelberg in cooperation with Lechtman, Granko, and Bratman<sup>2</sup>); in these the capacity of guinea pigs to produce antibodies (agglutinins, precipitins), and also their resistibility to general anaphylactic reaction with complete absence of free complement in the serum has been established.

The suitability of guinea pigs for immunological work on hydrophobia has not yet been studied. The study of this question is the purpose of our work.

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Two series of experiments were set up. In each series the capability of immunized guinea pigs to produce rabicidal antibodies and to develop a stable immunity against hydrophobia was studied. The experiments were carried out during a summer period (May-July).

At the same time immunization (with Fermi vaccine) of two groups of animals was begun: the first group, of 25 guinea pigs; and the second, the control group, of 15 rabbits. The animals were immunized in the course of 25 days, and were given 18 injections during this time. The dose for guinea pigs in each injection was 0.06 cc; for rabbits, 0.5 cc.

Two weeks after the completion of immunization, blood was aspirated from the heart of the guinea pigs and from the ear vein of the rabbits, and experiments were set up for the determination of the rabidity of the serum according to the method of Kraus, Koller, and Clorment.

For this purpose, sera of immunized guinea pigs were mixed in various amounts; then dilutions of 1:3, 1:5, and 1:10 were prepared from this mixture of sera, and were mixed again in equal parts with a one percent fixed virus as a result of which dilutions of 1:6, 1:10, and 1:20 were obtained. The same was also done with the sera of control rabbits. These dilutions were kept for 24 hours at room temperature and then injected subdurally into rabbits.

As a result, all 22 rabbits, injected with the fixed virus mixed with the sera of immunized guinea pigs (in dilutions of 1:6, 1:10, and 1:20), died of rabies. Of the rabbits injected with the fixed virus mixed with the sera of immunized rabbits, in those injected with serum dilution of 1:6, one rabbit out of five died of rabies; with a dilution of 1:10 seven out of ten animals and with the dilution of 1:20, two out of seven died -- that is, in this group of 22 rabbits, ten died of rabies.

In the control group all 15 animals (five guinea pigs and ten rabbits) injected with the mixture of fixed virus and the sera of nonimmunized animals died of rabies (see appended table).

Thus, the sera of immunized guinea pigs compared with the sera of immunized (control) rabbits in these experiments did not possess expressed rabicidal properties.

A month after the completion of the immunization, experiments were made to study the stability of immunity (by means of injection with lethal dose of fixed virus).

All immunized guinea pigs and rabbits remaining alive were subdurally injected with one lethal dose of our fixed virus (0.2 cc of medulla oblongata tissue in a dilution of 1:10,000).

Out of ten guinea pigs, eight died of rabies; out of 12 rabbits, four died. In the control group all unimmunized guinea pigs (6) and rabbits (3) died of rabies (see appended table).

In the experiments carried out it was evident that, in addition to the insufficient development of rabicidal antibodies, guinea pigs were significantly inferior to rabbits in the capability to develop immunity. Presuming that such unfavorable results of the experiments with guinea pigs possibly were due to an insufficient dosage of vaccine employed for their immunization (0.06 cc), we decided to repeat the experiment, using larger immunizing doses, 0.5 cc for guinea pigs and 2 cc for rabbits.

Twenty-five guinea pigs and 15 rabbits were thus immunized at one time.

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The number of injections was the same as in the first series of experiments. Two weeks after the completion of immunization, experiments were carried out to determine the rabidity of the sera.

Out of 19 rabbits injected with the mixture of fixed virus and sera of immunized guinea pigs, five animals became ill with rabies; out of 23 rabbits injected with a mixture of fixed virus and the sera of immunized rabbits, eight died of rabies. In the control group all ten animals (five rabbits and five guinea pigs) injected with a mixture of virus and normal sera (nonimmunized animals) died of rabies (see appended table).

A month after the completion of the immunization, experiments in survival were set up: out of 16 immunized guinea pigs subdurally injected with one lethal dose of fixed virus, 12 died of rabies; and out of 12 immunized rabbits, three died. In the control group all nonimmunized guinea pigs and rabbits (12) died of rabies from subdural infection (see appended table).

Although in the last experiment somewhat better results were obtained in the production of rabicidal antibodies in guinea pigs, nevertheless in the stability of the immunity developed, guinea pigs were significantly inferior to rabbits according to both the first and second series of experiments.

[Appended table follows.]

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Animal	No. of Im- munized Animals	Dilution of Serum	Efficacy of Serum		Mortality		
			No. of Infected Animals	No. Died With Rabies	No. of Immunized Animals Injected With a Lethal Dose	No. Died with Rabies	
First Series of Experiments							
Guinea Pigs	25	1:6	8	5	10	8	
		1:10	9	9	-	-	
		1:20	6	6	-	-	
Rabbits	15	1:6	5	7	12	4	
		1:10	10	7	-	-	
		1:20	7	2	-	-	
Rabbits	Nonimmunized	1:10	10	10	7	3	
Guinea Pigs	Nonimmunized	1:10	5	5	-	5	
Second Series of Experiments							
Guinea Pigs	25	1:10	13	5	16	12	
Rabbits	15	1:10	22	5	12	7	
Rabbits	Nonimmunized	1:10	5	5	4	3	
Guinea Pigs			5	4	6	5	

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